

**CRISIS ANALYSIS:
EXAMINING FACTORS IN THE 2007 FINANCIAL COLLAPSE**

by
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A practicum thesis submitted to Johns Hopkins University in conformity with
the requirements for the degree of Master of Science in Real Estate

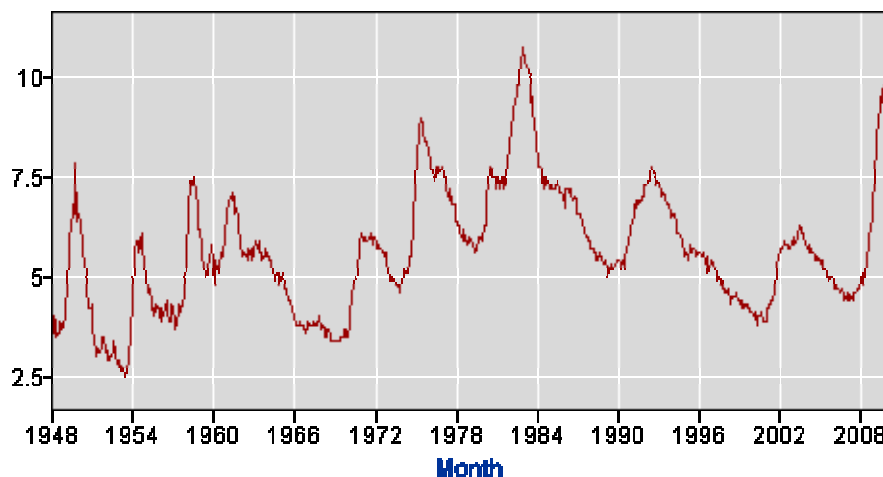
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Part I: Introduction

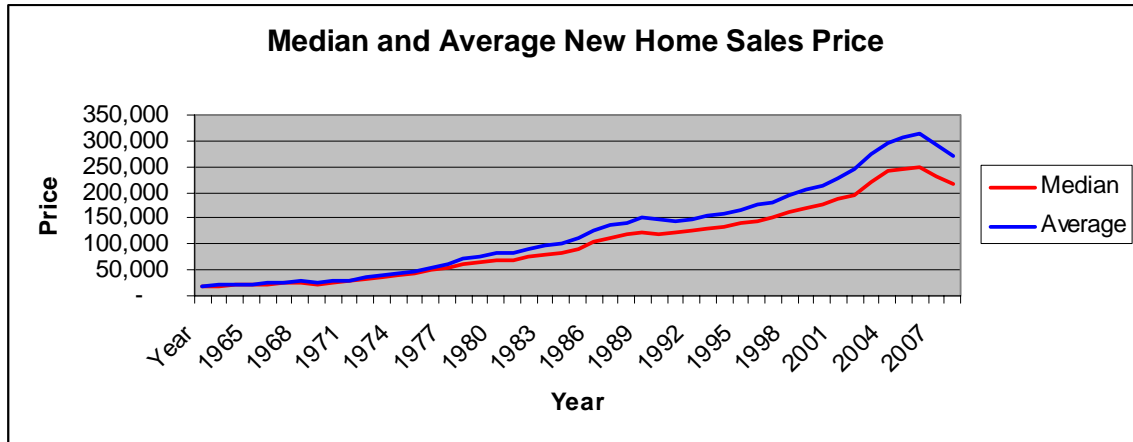
In October 2009, the seasonally adjusted unemployment rate in the United States reached 10.1%, the highest it had been since December 1982 (Bureau of Labor Statistics, 2010). The unemployment rate in 1982 was approximately 0.7% higher, and it had never been as high since the Bureau of Labor Statistics began tracking the figure in 1948. With some 150 Million persons in the workforce, such a figure translates to approximately 15 Million individuals seeking but unable to find a job—a little under 4.8% of the total population of the United States. Stated another way, one person in every cul-de-sac of twenty neighbors or class of twenty students is longing for a job he cannot find.

U.S. Unemployment Rate, 1948 – 2009

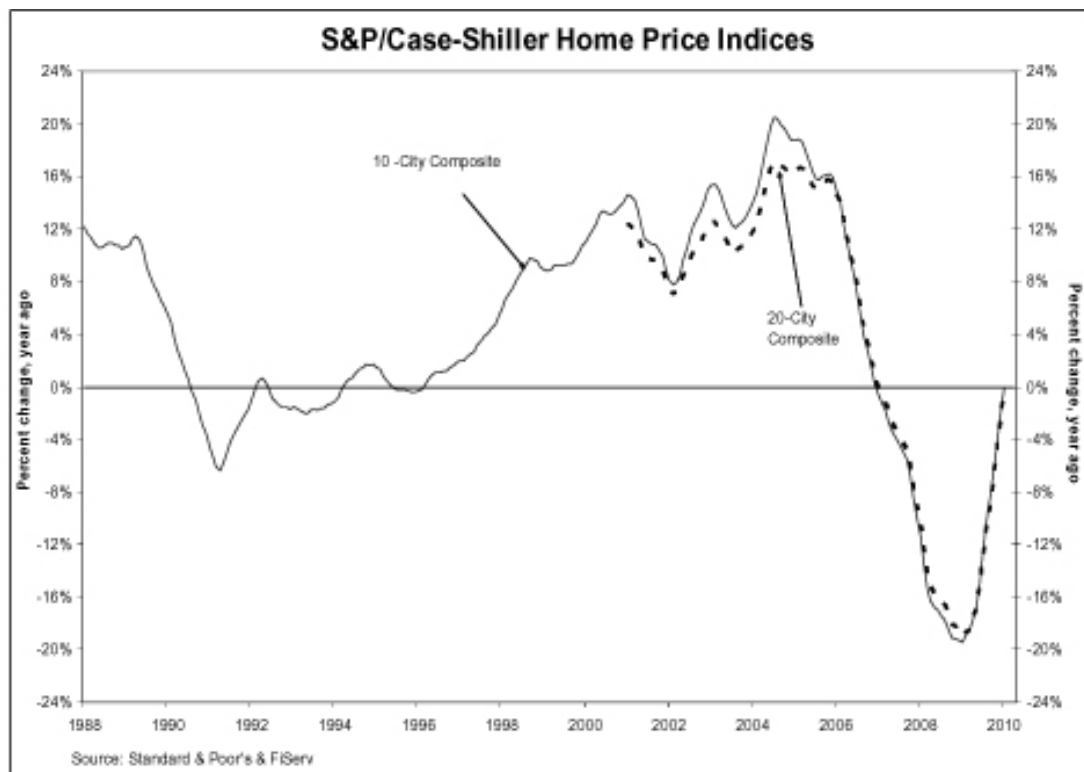
Source: U.S. Bureau of Labor Statistics



In January 2010, the median sales price of a new home sold in the United States fell to \$203,500, its lowest level since six years earlier (National Association of Realtors, 2010). Perhaps more importantly, in 2009 both the median and average new home sale prices fell for the second straight year, the first time either had done so since 1963.



Source: U.S. Census Bureau, Author.



High unemployment and depressed home values are only two of the symptoms of the economic decline which has and, as of the writing of this document, continues to impact the United States and, indeed, much of the world. Foreclosures continue at an increasing

pace: February 2010 was the fiftieth consecutive month of year-over-year increases in foreclosure activities (RealtyTrac, 2010). In the same month, in Nevada one out of every 102 households was in some stage of default. But the distress also reaches outside of real estate markets. 218 banks have failed from 2007 to February 2010, compared with only 41 such failures in the period 1997 – 2007 (FDIC, 2010). Automakers including General Motors and Chrysler, once giants of the national and world economies, have declared bankruptcy, along with numerous financial institutions. Total consumer credit outstanding, generally considered by economists to be an indicator of consumers' comfort in taking on new revolving (credit card, etc.) and non-revolving (auto loans, etc.) debt, steadily decreased from July 2008 to December 2009, and is seeing year-over-year decreases steeper than during any recession in modern history (Federal Reserve, 2010). Many state and local governments are at best extending furloughs to employees and, at worst, laying them off as tax revenues diminish. In December 2008, a committee of the National Bureau of Research Economics confirmed what many had known: the U.S. Economy entered a recession one year earlier. Perhaps the most notable quip summarizing the situation is attributed to Treasury Secretary Timothy Geithner in an April 2009 interview:

“Never before in modern times has so much of the world been simultaneously hit by a confluence of economic and financial turmoil such as we are now living through.”

The nation, and indeed much of the world, is in crisis. Thankfully, there is no dearth of commentary as to culprits and recommended solutions. Media, academics, and politicians alike daily opine as to the depth, causes, and ramifications of the situation. Once technical jargon now rests on the tip of many casual observers' tongues: “subprime”, “mortgage-backed securities”, “credit crunch”, “bailout”. Sorting through the commentary requires true detective work, and even the evidence must be checked for tampering.

This examination seeks to understand and explore several of the most frequently cited “factors” in the current economic downturn. Specifically, the following are considered:

- Mortgage lending and underwriting standards
- Homeownership, construction, population, and other macroeconomic forces
- Mortgage-backed securities (MBS) and similar securitization instruments
- Government-sponsored enterprises
- Agency ratings of MBS and similar instruments

These factors have been thrust to the forefront of the discussion on current market turmoil. This examination does not seek to place blame, but rather in two parts to consider correlation and causation. In part one, each above-mentioned factor is described and analyzed, with specific focus on whether recent movements and changes in each, if any, were “historically anomalous”. The financial and real estate crisis has certainly been exceptional; understanding which, if any, of these factors was simultaneously historically irregular will establish correlation. In the second part, causation will be considered by placing the factors in sequence to the extent possible. Finally, a conclusion summarizes the findings and provides suggestions for ways in which the United States and other similar, developed nations might avoid and address such crises in the future.

Part II: Factor Description and Analysis

Mortgage Lending and Underwriting Standards

Perhaps none of the above-listed factors is more frequently cited as the cause of the crisis than lenders and their flawed underwriting standards. In his March 13, 2008 “Memorandum for the President”, then Treasury Secretary Henry Paulson listed the “principal underlying causes of the turmoil in the financial markets”. First on the list: “a breakdown in underwriting standards for subprime mortgages” (Paulson, 2008).

In the single family market, mortgage lending is heavily reliant on borrowers’ credit history, ability to make monthly payments of principal and / or interest, and down payment capabilities. As these factors are scaled, defining “prime” and, therefore, “subprime” borrowers and lenders can be difficult. Commentators have adapted an initial distinction between loans as either “conforming” and “nonconforming”. Conforming loans are those that are eligible for purchase by the government-sponsored enterprises (GSEs) Fannie Mae and Freddie Mac because of their loan size and other underwriting

criteria (Chomsisengphet, 2006). It is worthwhile to note that very basic categorical definitions and distinctions in single family lending reference the GSEs. This demonstrates the interconnectedness of securitization and the GSEs to real estate lending.

Within the nonconforming category, loans may be further classified as “jumbo”, “Alt-A”, and subprime. Jumbo loans are those that are otherwise typically conforming, but are in amounts higher than allowed under GSE guidelines. So-called “Alt-A” mortgages are considered more risky than prime (conforming) mortgages, but less risky than subprime mortgages. They are typically characterized by borrowers with less than full income or employment documentation, average or slightly below-average credit scores, higher loan-to-value ratios, and more investment properties (Fabozzi, 2001). Subprime loans are made to borrowers with the highest credit risk, and are especially distinguished by increased borrowing costs, both in upfront fees and ongoing loan costs (Chomsisengphet, 2006). Beyond these two basic characteristics—lower borrower credit scores and higher loan costs—the precise definition of “subprime” is elusive. As Sengupta and Emmons (2007) note, “the prime-subprime distinction is not clear-cut and there is still some confusion regarding a precise characterization of subprime lending”. Nonetheless, subprime has, at least in recent years, come to mean loans made to borrowers who cannot otherwise obtain a conventional mortgage, usually due to impaired or absent credit history, perhaps including a recent bankruptcy or foreclosure.

Subprime lending is a relatively recent historical phenomenon, having been effectively birthed in two laws passed in 1980 and 1982 (Chomsisengphet, 2006). The Depository Institutions Deregulation and Monetary Control Act (1980) preempted state interest rate caps, and the Alternative Mortgage Transaction Party Act (1982) permitted the use of variable interest rates and balloon payments. Such practices had been discouraged and even outlawed in the years prior so as to encourage increased long-term investment in homeownership in the period following the Great Depression. Strict regulation by state and federal government over lending practices was replaced with federal disclosure laws, introducing a “buyer beware” atmosphere which did not exist prior to 1980 (McCoy, 2008). However, given that securitization would not experience its advent until a decade

later, most lenders underwrote their loan applications by hand and held their home mortgages in portfolios. This had the dual effect of decreasing funds available for lending and increasing lenders' requirements for only the most credit-worthy customers who were least likely to default.

Deregulation in 1980 and 1982 was accompanied by technological advances in lending. Specifically, McCoy and Renuart (2008) describe how the introduction of statistical credit scoring models and automated underwriting "made it possible to price disparate credit risks, opening up credit to people who had previously been deemed unqualified for loans. Statistical modeling gave underwriting professionals a sense of comfort that traditional underwriting requirements could be abandoned without significantly affecting default rates.

If federal deregulation and technological advances set the stage for subprime and nonconforming lending, the curtain rose, so to speak, with the Tax Reform Act (TRA) of 1986. It is noteworthy that the 1986 TRA in large measure placed new limitations on the amount of home mortgage interest which could be deducted from personal taxes. For example, home mortgage became limited to a buyer's first two residences, where previously any number of residences could have benefited from the deduction. But the element of the 1986 TRA which most influenced the current financial crisis is the elimination of interest deduction for personal interest with maintenance of the deduction—albeit scaled back—for mortgage interest. This in essence created tax distortions between homeowners and renters (Jackson, 2008). These distortions, translated into financial betterment for the class of consumers able to purchase, began a strong trend among Americans toward homeownership as the preferred housing alternative, which would be embraced and encouraged by politicians and financiers alike.

Economic expansion in the early 1990s saw growth in home values and some of the lowest interest rates in four decades. Responding to their increased purchase power and the desire to become homeowners, consumers increased their debt via home loans and home equity lines of credit. Competition in the lending markets increased. In response,

lenders expanded the use of all loan products, including subprime and nonconforming. In addition, the growth in both agency- and private-issued mortgage backed securities, and the willingness of investors to buy those securities, represented “an endorsement of the [subprime] product segment, and an impetus for expansion ” (Goliath, 2006). The historical growth of securitization is considered in greater depth later in this part.

The total amount of subprime loans originated grew significantly throughout the mid-1990s. In 1994 subprime lending totaled approximately \$35 billion, a little over 5% of all new mortgage originations. By 1997 that figure would grow to \$125 Billion, roughly 14.5% of all new home originations (McCoy, 2008). However, as interest rates dropped from 1997 through the end of the decade, the percentage of total originations which were subprime decreased back to a low point of 8.2% in 2001 (Chomsisengphet, 2006). This interplay with mortgage rates demonstrates a dangerous double-sidedness which subprime loans carry: as economic conditions improve, and accordingly the financial welfare of borrowers, they look to refinance into prime loans to lower their interest rates. However, subprime mortgages generally carry prepayment penalties, representing negative consequences for both buyer, lender, and MBS investor. On the other hand, when general economic conditions worsen, real estate values drop, and subprime borrowers lose their jobs in a market of increasing interest rates, they often face foreclosure, adjusting rates, ballooning principals, and other such difficulties.

Following the burst of the technology bubble in the early years of the new century, single family loan origination of all types accelerated exponentially, and the subprime category was no exception. In May of 2000, the Federal Funds rate—the rate established by the Federal Reserve which banks charge one another for overnight lending—was 6.50%. Starting in 2001, in an effort to ward off recession, the Federal Reserve repeatedly slashed the rate to an historic low of 1.00% in 2003. The average 30-year fixed mortgage rate followed suit, dropping from 8.52% to 5.23% over the same period. Total loan originations soared from \$1.048 trillion in 2000 to \$3.0 trillion in 2006. Perhaps more importantly, nonconforming loans (including subprime, Alt-A, and jumbo loans) grew

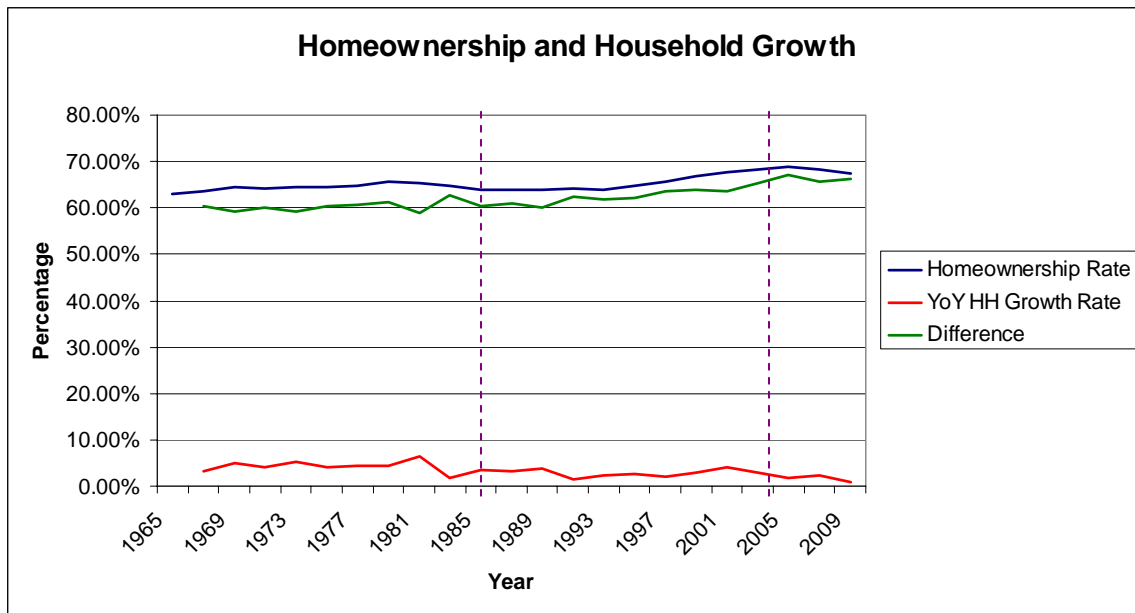
from comprising 29.8% of those originations in 2001 to 49.6% in 2006. Subprime mortgages alone accounted for 20.1% of all new originations by 2006.

Growth in subprime lending spurred some calls for re-regulation by the federal government. In 1994 Congress passed the Home Ownership and Equity Protection Act (HOEPA), which “prohibits certain predatory lending practices in the costliest subprime loans” (McCoy). HOEPA was widely regarded as narrow in scope; as of 2002, HOEPA applied to only one percent of all subprime loans. In the absence of more significant federal involvement, states acted. As of 2007 twenty-nine states and Washington D.C. had enacted HOEPA-like statutes, and all but six states regulated some number of subprime loan terms (McCoy). However State laws were largely preempted by federal regulations, the most notable of which were regulations passed by the Office of Thrift Supervision (OTS) in 1996 and by the Office of the Comptroller of the Currency in 2004. As McCoy and Renuart note, “these pronouncements permit national banks and federal saving associations to ignore a whole host of state credit protection laws.” In addition to exempting these agencies, the OTS and OCC regulations failed to put in place any comparable federal regulations, effectively creating a regulatory vacuum for federally chartered banks. The involvement of these federal agencies also created a dual regulatory system, where certain lending institutions are governed by certain state laws, while others—and even subsidiaries of the former—are governed by federal law. The unlevel playing field, combined with weak regulation, contributed to the explosion of subprime and lending.

Certainly that more lenders were making more subprime loans overall is evidence that a segment of borrowers not previously either desiring or capable of accessing mortgage credit was now finding a way. But real estate values were also rising, and it is therefore worthwhile to consider that benchmark ratios including loan-to-value could more easily be met during the heyday of subprime origination. The general consensus remains, however, that underwriting standards, especially for adjustable rate mortgages, were generally exploited as much as legally possible (and in some cases, illegally) between late 2004 and early 2007 to maintain a supply of qualified buyers for an increasing number of

subprime lenders (Paulson, 2008). In late 2006, “the first waive of risky ARMs made in 2004 and 2005 came due, and the house of cards fell apart” (McCoy, 2008). Foreclosures jumped from 750,000 in 2005 to nearly 1 Million in 2006 to more than 1.5 Million in 2007 (Federal National Mortgage Corporation). Upon recognition of the increasing number of defaults, banks tightened credit, just as home values were leveling off due to overbuilding (which is discussed in depth later). Subprime borrowers, especially those with adjustable rate mortgages initiated in 2004 and 2005, faced a mortgage marketplace with few options. As a result, defaults and foreclosures continued upward as homeowners failed to make payments. At current, some 28.7% of subprime loans are 90 days or more delinquent or in foreclosure, and even prime loans are defaulting at rates significantly higher than in any previous business cycle since the 1930s (Federal National Mortgage Corporation). Subprime lending has dried up, with subprime mortgages representing only 1.5% of all loan originations in 2008.

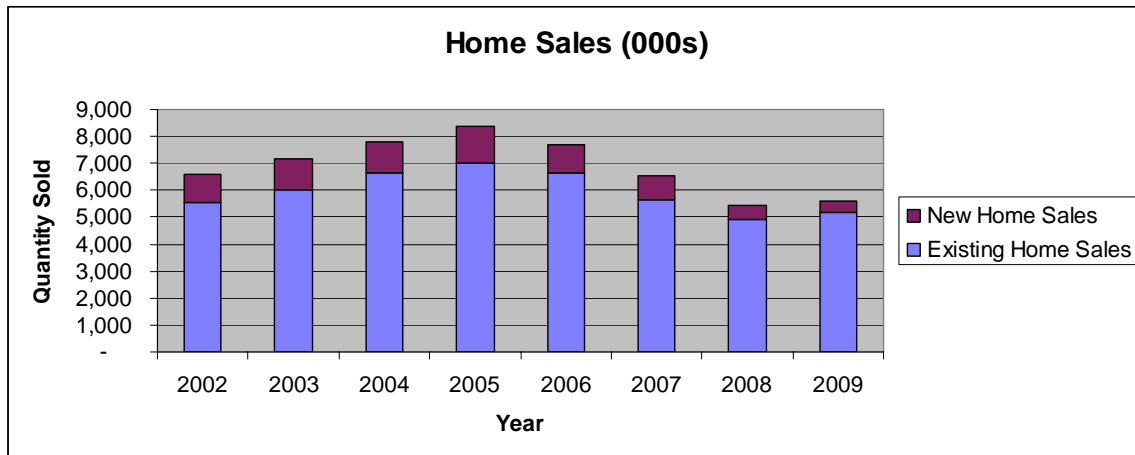
This segment of analysis seeks to determine if the changes in certain financial and real estate-related factors in the years leading up to the financial crisis were historically anomalous. A cursory review of recent lending history indicates that for prime lenders, underwriting standards have not changed significantly in the years prior to 2007. This is a worthwhile but oft unmentioned point. The underwriting in question, then, was specific to the subprime portion of loan originations. As the above details have revealed, regulation from the federal and state governments with regard to underwriting standards for subprime mortgages consisted mainly of maximum limitations. Within a wide spectrum of available lending term options, lenders established underwriting standards largely at their own whim. Furthermore, an historical analysis is difficult to conduct with subprime lending because its birth is so recent. Subprime lending in essence did not exist prior to 1993. Since then it has experienced a profound boom and bust, but that boom and bust cannot be considered on any historical scale. Only time will tell if subprime lending ever returns to the levels it reached in the mid-2000s, or if the recent, violent growth and decline of this industry represents a forever atypically volatile segment in its lifespan.



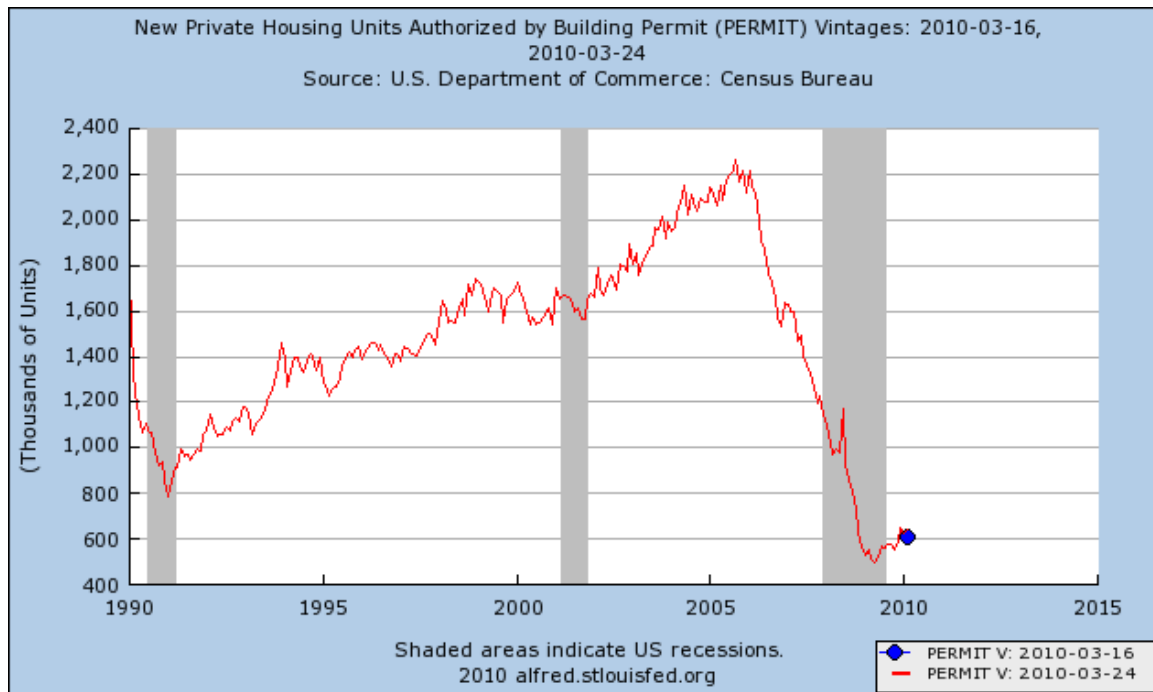
Source: U.S. Census Bureau, Author.

The chart shown above may seem innocuous enough. However it belies one of the most notable patterns of the U.S. economy in the years leading up to the financial crisis and 2007 recession. The two dotted, vertical purple lines are meant to highlight a particularly noteworthy segment of the chart. During this period, as can be seen, the homeownership rate in the United States increased relatively rapidly, from 63.89% in 1985 to 68.88% in 2005. During this same time, the growth rate of households in the U.S. remained relatively constant, averaging approximately 2.77%. That homeownership rates increased faster than household growth indicates that a portion of the pool of new owner households was not households newly created (by marriage, etc) but existing households *converting* to ownership. This further substantiates the concept that buyers previously unable to own were finding a way. Wheaton and Nechayev found that in the period between 1995 and 2005 the number of renters in the U.S. actually declined for the first time since World War II, with 500,000 renter households switching to homeownership annually.

Data indicates that both new and existing home sales increased in the period leading up to 2006 and 2007. Even more drastically, private housing units authorized by permit increased wildly in the same period.



Source: National Association of Realtors; U.S. Department of Commerce, Author.



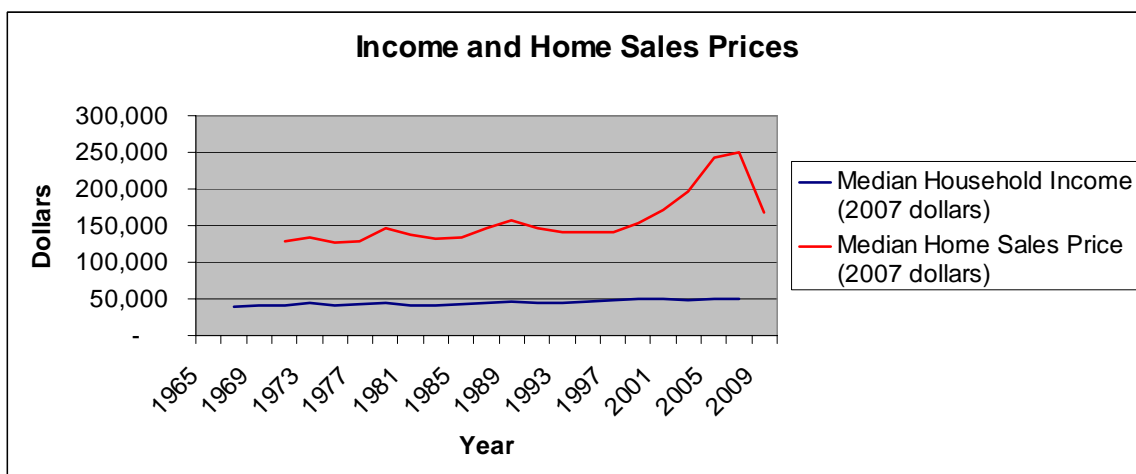
Source: Federal Reserve Bank of St. Louis.

New homes alone were being constructed at a faster rate than households were growing, and the inventory of housing units increased accordingly. In October 2005 the Single Family Housing Monitor summarized the situation as follows:

Housing activity continues to tread at a high level, although signs of slowing are mounting. Inventories are rising rapidly. The near record pace of construction is outstripping new demand in the nation's single-family housing market. The accumulation of oversupply is stable, however, with the months of excess supply hanging around 2.4 months for the last year. The supply buildup poses a downside risk for housing's outlook. Should the extraordinary factors that have been keeping housing markets roaring retreat sharply, they will leave exposed the weak underlying supply-demand balance trends.

Unfortunately, it seems few residential and commercial builders were listening.

Perhaps more importantly, the cost of new homes far outstripped the income of the average American consumer. The below graph evidences two separate but equally important realities. The first is the extent to which housing prices climbed in relation to median income in the years leading up to 2007 and 2008. As Klyuev (2008) writes, “it is widely recognized that by the mid-2000s home prices had reached levels not supported by fundamentals”. Whereas median household income increased 1.87% on average from 1995 to 2005, median home prices averaged a 10.44% year-over-year growth rate during the same period. To some, the wild increase in prices was clearly unsustainable.



Source: U.S. Census Bureau; National Association of Realtors, Author.

Wheaton and Nechayev (2008) summarize as follows:

“With certainty, average housing prices [over the period 1975 – 1998] grew in line with income. Since 1998, however, prices have risen almost 50% while incomes increased only 5% and 11%. These last eight years have indeed been remarkable.”

The second aspect of the chart worth noting is the contrast of the increase in home sales prices in recent years to other real estate cycles in modern history. Around 1980 and 1990, home prices reached new highs (for the time), then dropped severely. In the case of the 1990 “bubble”, one commentator noted a “brief era of gloom and doom” was ushered in. Yet the magnitude of these cycles is grossly insignificant when compared to the differential between trough and apex of the current cycle.

One other important economic fundamental to consider is the growth in second and investment home buying. Wheaton and Nechayev (2008) analyze this market by examining loan origination records where the buyer must, by law, declare whether the financing is for purchase of a primary home or other. They conclude that the sum of investor and second home origination as a percentage of all originations increased sharply from approximately 8% in 1999 to 17% in 2005. Expectedly, the growth was even more dramatic in markets like Atlantic City, NJ and coastal regions in Florida. Wheaton and Nechayev speculate as to the reasons for such growth: early retirement of the so-called “baby boomer” generation; the market’s view of real estate as a relatively stable asset class compared with stocks, which slid in value after the 2000 dot com bust, etc. But for the purposes of this analysis, it is worthwhile simply to note the increase in activity.

This part of the analysis seeks to determine whether variation, if any, in the five listed factors was “historically anomalous” in the years leading up to the recent recession. With regard to several macroeconomic factors, including new construction starts and sales, housing prices, and consumer spending, the above analysis indicates that pre-recession trends truly were historically significant. In other words, the 2005-era bubble of real estate as an asset class was significantly more severe than comparable historical housing bubbles.

Mortgage-Backed Securities

The mortgage market can be separated into primary and secondary components. Primary market lenders provide actual loans to borrowers, whereas the secondary market channels liquidity into the primary market by way of purchasing the loans, or packaging the loans, from the initial lenders. From the initiation of the modern mortgage market in the wake of the Great Depression through the late 1960s, mortgage loans made in the primary market were either held by the lending institutions or, infrequently, traded as whole loans (unsecuritized mortgages). Such lending practices decreased liquidity of the primary lenders, and in essence capped the size of the primary mortgage market.

The Government-Sponsored Enterprises (GSEs), consisting of the Government National Mortgage Association (“Ginnie Mae”), the Federal Home Loan Mortgage Corporation (“Freddie Mac”), and the Federal National Mortgage Association (“Fannie Mae”), are closely tied to the development of mortgage-backed securities. In 1968, Congress established Ginnie Mae with the express intent of increasing liquidity in the primary mortgage market. Ginnie Mae pioneered the use of mortgage pass-through securities, in which primary mortgages are pooled and used as collateral for the issuance of securities in the secondary market. Mortgage pass-through securities represent a simpler version of their more modern cousin, Mortgage Backed Securities (MBS). MBS may securitize Residential (RMBS) or Commercial (CMBS) loans. Asset-Backed Securities (ABS) are a category of security backed by any consumer-related product (for instance, credit car loans or credit card debt). Collateralized Debt Obligations (CDOs) are those securities backed by consumer debt obligations. There are further distinctions between MBS, ABS, and CDO but for the purposes of this analysis the above “rule-of-thumb” distinctions will suffice, and MBS is the focus of discussion.

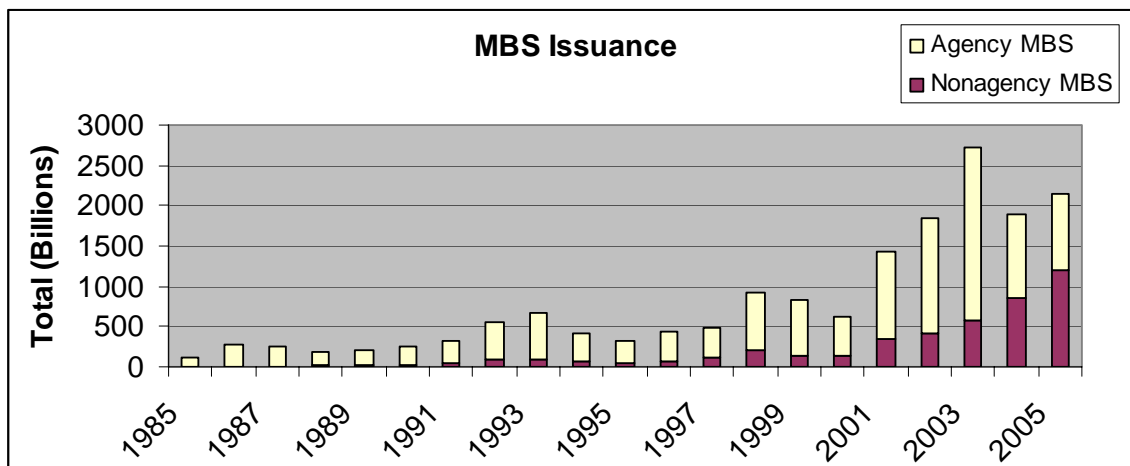
Ginnie Mae does not buy or sell loans or issue MBS; instead it guarantees payments on MBSs that are backed by federally insured or guaranteed loans. Ginnie Mae first guaranteed a pool of loans in 1970, followed by Freddie Mac in 1971, and Fannie Mae in 1981 (U.S. Securities and Exchange Commission). By selling the primary mortgages to

investors, who in turn benefit from the flow of principal and interest payments over the duration of the loan, primary lenders recognize immediate capital replacement, enabling them to initiate new primary loans. The virtues of securitization are widely extolled, though perhaps less so now than before 2007. Primarily, the securitization process provides liquidity to primary lenders while allowing them to pass interest rate risk on to a broad array of investors.

Since its inception in the late 1960s, the securitization market has grown tremendously. A government task force formed in 2002 to conduct a study of the MBS market notes it grew some 800% between 1983 and 2003. As of June 2009, of public and private bond debt totaling \$34.3 Trillion, mortgage-backed securities comprised \$8.9 Trillion, or roughly 26%: the single largest fixed-income sector (Federal National Home Loan Mortgage Corporation). Most notable is not the mere fact that MBS issuance was growing in the years leading up to 2007, but that the portion of originations packaged into securities was also increasing, growing from nearly 0% of all originations in the late 1980s to nearly 62% of all originations in 2001, to 77% of all originations in 2006 (Federal National Mortgage Corporation). During its growth, the industry has introduced new products including Collateralized Mortgage Obligations (CMOs) and stripped MBS. The exploration of these instruments is beyond the scope of this analysis, but it is worthwhile to note that many such products were created to match investors tolerant of greater risk to products offering greater reward (higher yields).

Perhaps the most notable growth in MBS markets was in the total issued by non-agency entities (i.e. not by the three GSEs mentioned above). The first so-called “private label” MBS was issued in 1977 by Bank of America, however there was little activity in the private MBS market until the early 1980s. Many of the regulatory constraints affecting private entities were removed in 1984 with the enactment of the Secondary Mortgage Market Enhancement Act. Private participation was further encouraged with the passage of the Tax Reform Act of 1986, which eliminated a double taxation issue which had previously hindered the abilities of private MBS issuers, and in so doing gave rise to Real Estate Mortgage Investment Conduits (REMICs). The GSEs primarily utilize the pass-

through security structure whereas non-agency issuers favor REMICs. Non-agency MBS issuance grew from slightly under \$2 Billion in 1985 to almost \$7 Billion in 1986. From 1986 through 1993 the industry continued exponential growth, peaking in 1993 at nearly \$100 Billion. As can be seen in the below chart, however, this growth was nothing compared to what would happen next. After sliding back to nearly \$50 Billion in 1995, non-agency MBS issuance would grow to \$203 Billion in 1998, slowing to \$135 Billion in 2000 before skyrocketing to nearly \$1.2 Trillion in 2005. The growth between 2000 and 2005 alone represented a 776.2% growth rate.



Source: Federal Deposit Insurance Corp.

Agency MBS experienced growth in the same periods, but with far less volatility. To wit, in the period between 1985 and 1997, agency issuance averaged \$359 Billion, with eight year-over-year increases and seven year-over-year decreases during the fifteen year period. Between 2000 and 2003 the agency portion of MBS issuance did see tremendous growth, from nearly \$479 Billion to over \$1 Trillion, a 345% increase. However, just two years later, in 2005, over half of that growth was lost. In 2005, non-agency MBS issuance surpassed agency issuance for the first time in history.

The above discussion indicates that securitization of mortgages on the whole grew greatly from 1990 to current, and that non-agency securitization grew exponentially faster than agency securitization in the years leading up to 2007. One last point worthy of note is the tremendous growth in the securitization of subprime loans in particular. Inside Mortgage

Finance notes that subprime MBS issuance comprised approximately \$20 Billion in 1995, less than half of all non-agency MBS issued. In three years that figure would more than triple, to approximately \$75 Billion. Such growth, though rapid, was reflective of the overall growth in non-agency MBS. After slight decreases in the end of the 1990s, the amount of subprime non-agency issuance would jump from \$50 Billion in 2000 to over \$450 Billion in 2005. Similarly, the FDIC reports that Alt-A loans comprised 1% of all non-agency MBS in 1995 and 26% in 2005. Starting in 2004 and continuing for the next three years, the portion of non-agency MBS collateralized by subprime loans was greater than that collateralized by prime loans. In short, MBS investors were buying more non-agency MBS, and a greater portion of their investment was made up of subprime loans. It is worthwhile to note that by 2008, the non-agency MBS market had all but disappeared, decreasing to approximately 2.4% of total MBS issuance.

One might suspect that as MBS investors—largely institutional—sank billions into riskier (subprime) loans which comprised an increasing portion of the comparatively riskier non-agency MBS market, the investors would look to hedge their increased risk accordingly. Credit enhancement provides the primary means of risk management in non-agency MBS. In the late 1980s, credit enhancement had been accomplished largely through corporate guarantees, letters of credit, excess interest charges, or insurance. These methods are considered “external” credit enhancement, because they are “outside” the actual security. However, as MBS markets grew through the 1990s, these external credit enhancements were increasingly replaced with “internal” methodologies including overcollateralization, excess spread, and (especially) subordination. Overcollateralization refers to the value of the collateral being larger than the security which it backs. Excess spread likewise occurs when the coupon on the issued security is less than the interest rate received on the underlying collateral. In subordination, the debt instrument is separated into tranches, with a senior tranche and one or more subordinated tranches. If the pool defaults, the subordinated tranches incur first loss, thereby protecting the senior tranche. That the senior position holders were first to receive payment meant that they were paid the lowest interest rate. Investors in the most junior tranche—often known as the “equity piece” or “first loss position”—were rewarded for their riskier investment

with higher interest payments. As the non-agency securitization market churned out cash, many issuers (both agencies and non-agencies) noted the success, and many purposefully kept the junior tranche for themselves, marketing to investors that they were maintaining “skin in the game”. The listing below, excerpted from the Financial Crisis Inquiry Commission’s April 2010 report on Securitization and the Mortgage Crisis, shows the top 10 non-agency issuers in 2007, many of whom maintained the “equity tranches” in their issuances:

- | |
|--|
| <ol style="list-style-type: none">1. Countrywide Financial*2. Lehman Brothers†3. Wells Fargo & Co.4. Washington Mutual†5. Bear Stearns*6. JPMorgan Chase7. Deutsche Bank8. Residential Funding Corp.9. Merrill Lynch*10. Morgan Stanley |
|--|

These 10 issuers accounted for 56% of all non-agency MBS issuance in 2007. Asterisks in the above table denote firms which have been acquired since 2007, while crosses indicate firms which have subsequently declared bankruptcy.

This part of this analysis seeks to understand the extent to which activity in the mortgage-backed securities market was “historically anomalous” in the years leading up to 2007. Much like subprime lending, the MBS market suffers from a short history against which to judge. It is worthwhile to summarize however that the agency MBS market experienced nearly thirty years of stability from its inception in the late 1960s through its overheating in the early 2000s. The non-agency MBS market, younger and less regulated, experienced truly unbelievable growth in the early part of the new century which, even compared with its limited history, was unusual. Lastly, more notable than the overall growth of agency and non-agency MBS markets was the increasing presence of subprime loans in the collateral comprising these MBS, and the simultaneous steadily decreasing subordination levels required by the rating agencies. Securitization, which

had been used in years prior nearly exclusively for prime mortgages by the GSEs, with generally positive results for lenders, investors, and homeowners alike, was increasingly being utilized for lower quality mortgages by non-agency institutions (Valukas, 2010).

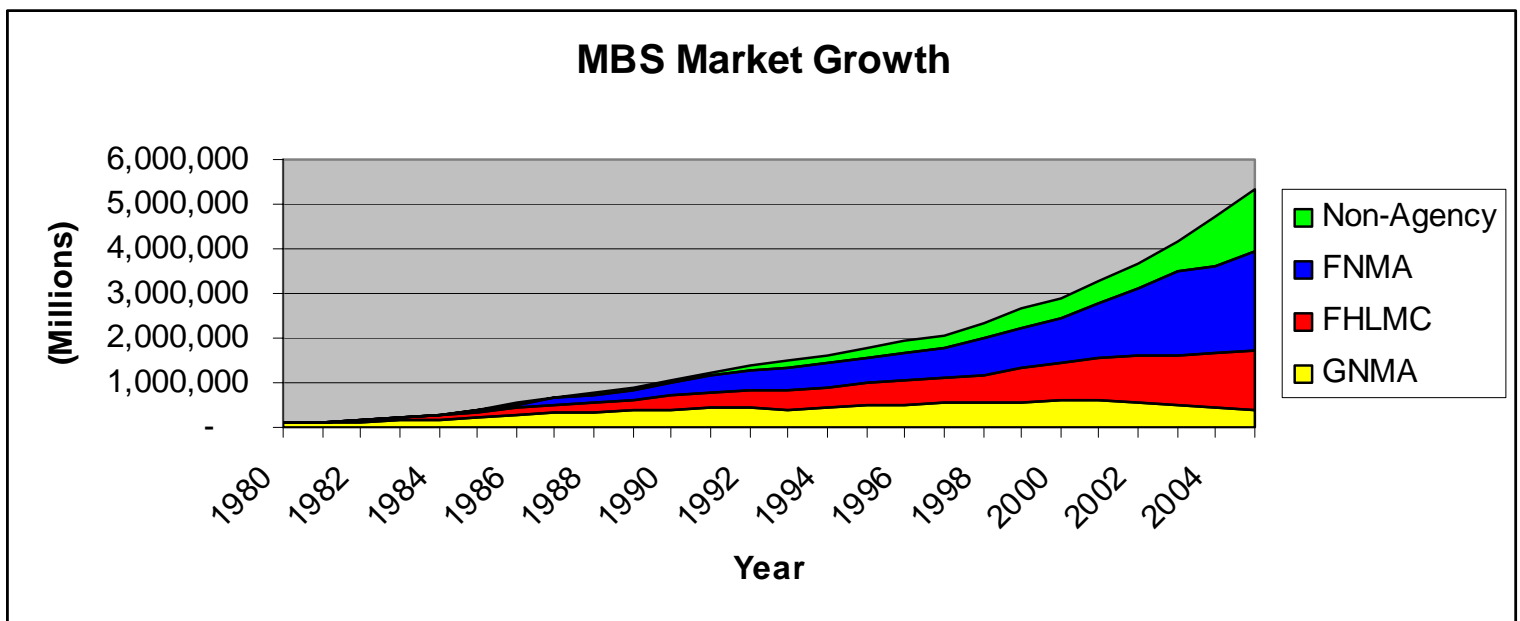
Government-Sponsored Enterprises

The Federal National Mortgage Association (“Fannie Mae”) was initially formed as a wholly-owned government corporation—a federal agency—in 1938. Thirty years later, the Johnson Administration bifurcated the agency into two separate organizations. The new Fannie Mae became a Government Sponsored Enterprise, or GSE: a publically traded, for-profit, non-government organization whose operations were removed from the federal budget. GSEs are different from typical corporations, among other ways, in that they are limited to carry out the business activities authorized by their charters. The second organization formed in the bifurcation was Ginnie Mae, which remained within the U.S. Department of HUD, and whose operations are reflected on the federal budget. In 1970, Congress chartered Freddie Mac to serve generally the same purpose as Fannie Mae, and also authorized both Fannie and Freddie to expand their purchases to conventional (non-federally insured) mortgages up to a specific amount. Ginnie Mae was not authorized to purchase conventional mortgages or to maintain a portfolio of its own. The two GSEs initially held mortgages on their own balance sheets, but by 1981 both Fannie and Freddie were securitizing most of the loans they purchased. It is important to note that, until September of 2008, an important difference between Fannie and Freddie and Ginnie was that Ginnie was backed by the “full faith and credit” of the U.S. Governments, in other words the U.S. Government guaranteed payments to investors. Such guarantee did not exist for Fannie and Freddie.

In 1992 Congress passed the Federal Housing Enterprises Financial Safety and Soundness Act which authorized the Secretary of HUD to set affordable housing goals for Fannie Mae and Freddie Mac. The legislation mandated that a certain percentage of loans purchased by the GSEs had to be written in certain areas, where growth in affordability of homeownership was an objective. The Act also created the Office of Federal Housing Enterprise Oversight (OFHEO), a regulatory body within HUD with

responsibility for ensuring that Fannie and Freddie were adequately capitalized and operating safely. OFHEO was required to have its budget approved by Congress every year, contrasting with the agencies that regulate banks, which set their own budgets.

While the agencies' historical participation in MBS markets indicates nominal growth consistent with the overall MBS industry, it also reveals lost market share in the years leading up to the current financial crisis. In 1983, with a total MBS market of approximately \$242 Billion, the agencies issued 100% of all MBS. Of this, Ginnie Mae represented approximately 65%, Freddie Mac approximately 24%, and Fannie Mae the remaining 11%. By 1990, agency MBS issuance would shrink to comprise 95% of all originations, with Ginnie, Freddie, and Fannie at 40%, 31%, and 29%, respectively, of all agency issuance. By 2003, agency issuance receded further, comprising a mere 84% of all MBS issuance. By 2005, that figure would shrink to 74%, with Ginnie, Freddie, and Fannie comprising 11%, 32%, and 57% of agency issuance, respectively. This data reveals both the explosive growth in non-agency MBS which was discussed in the previous section, but also the relatively steady involvement of Ginnie and, to a lesser extent, Freddie, compared with expansion of Fannie's agency proportion.



Source: Inside MBS and ABS; UBS, Author.

Explosive MBS investment growth and market share loss are not the only notable elements in Fannie Mae and Freddie Mac's history in the years leading up to the financial crisis. The relationship between the agencies, their regulator, and Congress is speckled with conflicts and questionable outcomes, ever the more so in hindsight. As the companies grew their business in the 1990s, competitors and politicians alike became increasingly concerned about the risk their failure might have on the housing and finance systems. In 1999, Treasury Secretary Larry Summers quipped that "debates about systemic risk should also now include the government sponsored enterprises". Treasury's Undersecretary for Housing commented that the agencies' lines of credit with Treasury should perhaps be reconsidered. In 2002, accountants and investors became suspicious that the agencies were putting billions in derivatives losses on their balance sheet instead of their income statements, and thusly overstating profits. In the wake of the Enron scandal, after Freddie fired its longtime accounting firm Arthur Anderson, the company admitted to smoothing out earnings for several years. Soon after, in 2003, the Bush Administration provided OFHEO funding with which to hire Deloitte & Touche to conduct an investigation of Fannie Mae's accounting. That same year, Representative Richard Baker, a Republican from Louisiana, introduced a bill which would have stiffened regulation of Fannie and Freddie. Among other things, the bill proposed to abolish OFHEO in lieu of a new regulator, whose budget would be set not from congressional appropriations, but fees levied directly on the GSEs, in amounts determined by the new regulator. The bill eventually failed. In September OFHEO, utilizing Deloitte's services, published a report accusing Fannie Mae of numerous accounting mistakes, including deferring expenses so as to report a higher price per share, and pay out executive bonuses dependent on such figures. Hearings were held in Congress to investigate the report, and to label these as politically energized would be an understatement. Republicans largely noted concern over the agencies' accounting and lauded the report; Democrats protested the need for hearings. Representative Maxine Waters, Democrat from California, noted:

"Under the outstanding leadership of Mr. Frank Raines, everything in the 1992 Act has worked just fine. In fact, the GSEs have exceeded their housing goals. What we need to

do today is focus on the regulator, and this must be done in a manner so as not to impede [the GSEs'] affordable housing mission."

In an unusual move, the then-Fannie CEO Frank Raines requested a follow-up investigation by the SEC to dispute the OFHEO report. In December 2002 the SEC announced that it had determined Fannie Mae's accounting did not comply "in material aspects", and that its earnings would have to be restated. Raines resigned 8 days later.

In the wake of their accounting scandal, under the leadership of new CEO Daniel Mudd, Fannie—and Freddie, to a lesser degree—entered a period of heightened scrutiny. That scrutiny took two important forms: (1) concern over their financial safety and soundness and (2) pressure to perform the "mission". Opining on the first of these, in 2004, the usually-tempered Alan Greenspan commented that "to fend off future systemic difficulties, which we assess as likely if GSE expansion continues unabated, preventative actions are required sooner rather than later." In late January 2005, Republican Senators introduced the "Federal Housing Enterprise Regulatory Reform Act", which would have established an office with regulatory powers over Fannie, Freddie, and the Federal Home Loan Bank system. But the bill met with resistance, and was not passed. Regarding the second form of scrutiny—pressure to perform the "mission"—the Bush administration, under the leadership of then HUD Secretary Alphonso Jackson, increased the GSEs affordable housing goals repeatedly. In 2006, HUD Assistant Secretary Brian Montgomery presented Congress with the FHA Modernization Act, which would "enable FHA to reach deeper into the pool of prospective borrowers", and eliminate FHA's 3% down payment requirement, "reducing a significant barrier to homeownership". Though FHA's business is not identical to that of the GSEs, the overall message from government was being made clear: more people should own homes. The FHA bill was passed in the House, but did not clear the Senate. Similar measures and statements continued in 2006 and 2007.

As housing prices cooled, and the effect of collateralized subprime mortgages became apparent, Fannie and Freddie began an ironic new two-pronged role. They were losing tremendous money, while nonetheless remaining vital to the U.S. housing market as the

non-agency market disappeared. A Congressional Research Service reports notes that had the GSEs been private companies, they may have failed completely by mid-2008. Yet they continued to be able to fund their deficits by issuing bonds which the market bought, likely because it had come to rely on the implicit guarantee of the federal government to support the institutions in times of trouble. Several research articles note the historical precedent for that implicit guarantee based on the government's bailout of the troubled Farm Credit System in the late 1980s, but a discussion of that incident is beyond the scope of this analysis. Despite the implicit guarantee, Fannie and Freddie's share prices dropped so catastrophically—over 60% for both firms—that in mid-2008 their ability to access credit became questionable. On September 7, 2008, the GSEs were placed into conservatorship: legally directed and controlled by the U.S. Government. The implicit guarantee had become actual.

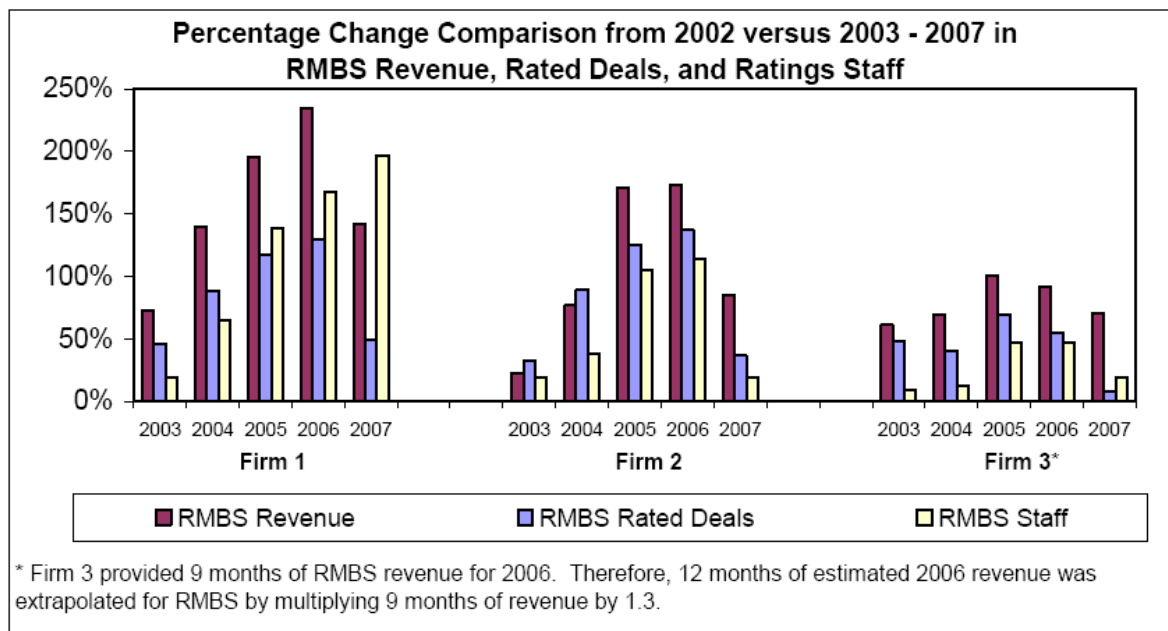
This section of analysis attempts to determine if the history of the GSEs in the period prior to the financial meltdown was anomalous. The above research indicates that was largely the case. Fannie and Freddie were increasing losing market share compared to historical benchmarks and yet were under increased pressure from Washington to perform. Their purchase and resale of increasing amounts of non-prime mortgages represented a deviation from previous practices. And their inability to access capital through the stock market represented a questioning of the agencies' very ability to exist, and would eventually necessitate government involvement.

Rating Agencies

Credit rating agencies (CRAs) are private companies which measure and rank the credit worthiness of certain organizations or financial products. Over 100 CRAs exist, but three—Moody's, Standard & Poor, and Fitch—control 95% of the industry. The CRAs rate a variety of structured finance products, including MBS—both Residential (RMBS) and Commercial (CMBS)—and Collateralized Debt Obligations (CDOs). As discussed above, securitization issuances are separated into different tiers of risk, which then carry different yield expectations. Each tranche is rated by a credit rating agency. The credit rating indicates the CRA's view as to the creditworthiness of the debt in the MBS, in

other words the likelihood that the issuer will fail to meet its obligation to make (pass through) principal and interest payments to the debt purchaser. The CRAs are generally provided information on the underlying mortgages and assets such as terms, geographical location, credit history and credit score of the borrower, the loan's lien position, etc. A CRA analyst determines the likelihood that the underlying borrowers will default given stresses of varying severity. The rating agencies publish their decisions and are typically paid only if the credit rating is issued.

As the below graphic indicates, the years leading up to the financial crisis saw significant growth in the workload, staff levels, and revenues of all three major CRAs.



Source: U.S. Securities and Exchange Commission

In an investigation of the firms' practices and role in the financial crisis, the Securities and Exchange Commission determined that the complexity of the financial products the CRAs were rating had grown exponentially, in some cases beyond the firms' abilities. Internal documents from the CRAs reflect inability and / or unwillingness to adapt to the volume and complexity of transactions occurring.

The aforementioned SEC report also comments at length on the conflicts of interest inherent in the “issuer pays” model. Throughout their history, the CRAs have been paid fees by the agency issuing the security, which creates a conflict of interest between the issuer seeking a favorable rating on its product and the CRA responsible for providing the analysis. Though regulations require the management staff negotiating fee structures to be different from the analysts providing the rating opinion, the SEC report noted that in fact this is often not the case, and that two of the three major CRAs maintained no active system for monitoring of the possible conflicts of interest. Similarly, a report on the bankruptcy of Lehman Brothers found that the organization had “market power” over the rating agencies because they issued so many MBSs. Whereas in traditional bond ratings, where the agencies have thousands of clients—many corporations and municipalities issue bonds—in structured finance (the world of MBS, ABS, and CDOs) a few investment banks dominate.

Another important element of the rating agency industry is that it is responsible for the definition of its ratings. Institutional investors are committed to purchase only those securities with a certain minimum rating—but the very definition of AAA, or BB, or BBB is created by the rating agency. This rating may or may not remain consistent within the agency from year to year, or between agencies, or between financial products. For instance, corporate bonds rated “Baa” by Moody’s had an average default percentage of 2.2 in 5-year periods from 1983 to 2005. CDOs rated “Baa” by the same agency had an average default rate of 24 percent over 5-year periods in the same range. Moreover, CDOs rated “Ba”—slightly worse, and the highest-rated non-investment grade—had an average default rate of 25.3% over the same period.

In addition to playing the role of definer, the rating agencies also act as de facto regulator “in a market that has no official watchdogs” (Bloomberg). However, that the firms are often viewed as regulators, definers, or authorities by the market does not mean that they share that opinion of their role. Says a senior managing director at Moody’s: “many people have the tendency to rely on [our ratings], and we want to make sure that they

don't". S&P includes template language in its CDO ratings that instruct investors not to base any investment decisions on its analyses.

The rating agencies consistently rated more and more MBS containing subprime mortgages in the years leading up to 2007. According to data provided by Moody's and S&P, subprime mortgage securities comprised approximately \$100 Billion of the \$375 Billion of CDOs sold in the U.S. in 2006. And their revenues have increased accordingly. Because of the complexity of CDOs and asset-backed securities (ABS), the CRAs charge nearly three times as much to rate these financial products. In the three years leading up to 2007, the CRAs made more money rating CDOs and ABSs than any other financial product—including corporate and municipal bonds. In the case of Fitch, ratings of structure finance products accounted for more than half its total revenue in the year ending September 2006. Moody's tripled its profits in the years from 2002 to 2007.

As subprime borrowers began to default and the questionable nature of the products became evident, the three largest CRAs downgraded more than 93% of all MBSs to junk status, devaluing the securities and forcing investors in turn to write down the value of the products. In April 2007 Moody's announced that the model it used since 2002 to evaluate the MBS it rated would be laid aside and a new model used. The revelation that a model 5 years old had been used in a mortgage market changing daily stunned the structured finance world. As defaults continued, the rating agencies began to downgrade MBS and CDO ratings in extreme quantity, often to levels multiple "notches" lower. In the third quarter of 2007, the agencies downgraded \$85 Billion in mortgage securities. In the following three quarters the figure would increase: \$237 Billion, \$739 Billion, and \$841 Billion. First loss positions were immediately wiped out, and institutional investors who held CDOs had to write down extraordinary losses.

This section of analysis seeks to analyze whether the events involving credit rating agencies in the years leading up to the 2007 were historically anomalous. Unlike subprime lending and mortgage backed securities, considered elsewhere in this analysis, the history of credit rating agencies is not short: John Moody issued his first ratings

analysis of the railroad industry in 1909. But the growth in securitization, and the demand for ratings of complex, multivariate MBS and CDO securities, was exponential and new to the agencies. Along with this increased activity grew revenues and profits. Their ratings systems did not change, but the amount of subprime mortgage collateral comprising the securities they rated did.

Part III: Causality

The previous section of this analysis sought to understand to what extent, if any, the years leading up to the financial crisis were “historically anomalous” in the case of five separate commonly-blamed factors of the crisis. This section speaks to causality, and how the above-described factors interacted to cause the current economic crisis.

The most logical organization of causes and effects is chronological. Of course defining cause and effect is often a never-ending cycle: if a baby knocks her milk off the tray in front of her, and it spills on the floor, do we blame the baby for knocking it over, the parent for putting it in front of her, the babysitter who purchased the milk, or the parent for bearing the child? One must establish a starting point. For the purposes of this analysis, given the five factors considered above, the starting point of analysis is the increased activity in residential construction—a macroeconomic factor. Fueled by the low interest rates and times of general economic prosperity, commercial builders constructed record amounts of new homes, outstripping both the nation’s demand for new housing and the income capabilities of the average homebuyers.

Perhaps the overbuilding in residential markets in the late 1990s and early 2000s would have subsided had it not been for the builders’ ability to sell the homes they were producing. As noted above, the homeownership rate in the United States increased from approximately 64% to 69% in the 20 years between 1985 and 2005. This extraordinary growth was fueled by several factors. Firstly, the same relatively low interest rates which were encouraging builders to borrow to construct and businesses to borrow to expand were encouraging renters to buy and convert to homeownership. Secondly, extraordinary growth in non-conforming mortgage products was allowing mortgage lenders to entice

households who had never before owned a home to do so. The Tax Reform Act of 1986 had, as noted above, cemented the income tax benefits of homeownership in lieu of renting, and additional financial, moral, and intellectual appeals in favor of homeownership were issued from the highest echelons of government. Homeownership was and, to many remains, the American Dream. Additionally, in the wake of substantial downturns in the stock market in the early 2000s as a result of the so-called “dot com” bust, homeownership—and homeownership related finance, as is considered next—was becoming increasingly viewed as a best possible investment alternative. “We value your residency in Anaheim”, stated the Mayor of that City in his 2004 annual address, “and if you want to invest in your home, the government fees and government bureaucracy will not stand in the way of making your home into your *dream* home.”

Whether mortgage lenders sought new buyers to fill the record number of homes being sold or buyers sought mortgage brokers to make a deal for them is a distinction to be considered in more detailed analyses. There is evidence of both predatory lending and predatory borrowing. But the conclusion noteworthy for this analysis is that lending did increase, at record rates. The cause for this had much to do with the tremendous growth in securitization, which allowed lenders to rid their books of the loans they made often immediately after having made them. The point that being able to sell a product for a profit immediately after buying it causes reduced incentive to properly value the product need not be labored. Certainly, there existed requirements in such sales stipulating that if borrowers did not make payments within the first 60 days or even 6 months of a mortgage, the lenders would be required to repurchase the mortgage. But many of the products sold were 30-year mortgages, a period of time far greater than the duration of the repurchase requirements. And, more importantly, many of the products were affordable to borrowers in the early years, but had adjustable terms which would increase the burden, or necessitate refinancing, in later years, after repurchase requirements had expired.

The extraordinary growth in securitization connected the subprime crisis to Wall Street, and specifically to mature investment houses with highly educated leadership and

extremely strong balance sheets. Specifically, the growth in private label MBS, as opposed to the agency-issued securities, placed subprime assets in the coffers of many investors. The modernization of the securities markets, growing from pass-through securities to MBS and CDOs, to CDOs², which consisted of CDOs collateralizing other CDOs, introduced a level of systematic risk for which the securities holders were not properly compensated. Losing market share, the GSEs would begin to dabble in subprime securitization, introducing toxic assets to their books. Eventually, as their share prices fell and the threat of total collapse of the secondary housing markets loomed, the government would have to act on their implicit guarantee, furthering economists' observations of moral hazard in the financial sector.

Lastly, investors in securities relied on two fundamentals: that real estate was local and would never depress across the entire nation, and that rating agencies were conducting adequate due diligence on their behalf. Muddying the understanding of securities by using the same rating scale and terminology used for traditional, single issue corporate and municipal bonds, rating agencies themselves failed to appreciate and highlight the very factors that made the multi-asset securities different from those traditional bonds: default commonality, credit enhancement, lack of historical comparability and data, and systematic risk. Not since the 1930s had real estate values across the United States decreased so substantially. The rating agency models failed to account for such a possibility. Robert Rodriguez, Chief Executive Officer of First Pacific Advisors, recalls the following March 22 conversation with an analyst from Fitch which lays bare the rating agencies' inability to predict this systematic, large scale asset devaluation:

FPC: "What are the key drivers of your rating model?"

Fitch: "FICO scores and home price appreciation of low single digit or mid single digit, as home price appreciation has been for the past 50 years."

FPC: "What if home price appreciation was flat for an extended period of time?"

Fitch: "Our model would start to break down."

FPC: "What if home prices were to decline 1% to 2% for an extended period of time?"

Fitch: "The models would break down completely."

FPC: "With 2% depreciation, how far up the rating's scale would it harm?"

Fitch: "It might go as high as the AA or AAA tranches."

Thus, what began as an historically significant period of overbuilding provided shelter for a wave of new homeowners with complicated, atypical mortgages. As the asset bubble deflated, those atypical mortgages rocketed through the American financial system, affecting both private and public balance sheets, via risky securities not properly understood or valued by the various investors. Lastly, through the inter-relatedness of the players in that financial system, the concept of “too big to fail” became a reality: if firm X fails, then all the debt firm X owes to firms Y, Z, and Q pulls them down too. And as credit markets froze and dried—because no one would lend to X, Y, Z, or Q—the housing problem extended to other segments of industry and economics.

Part IV: Conclusion

As of the writing of this analysis, problems in multiple financial and economic sectors remain existent and unsolved. There have been numerous bodies convened to examine the crisis, its causes, and possible solutions. Perhaps the most prominent of these is the Financial Crisis Inquiry Commission, a ten-person bipartisan body established to investigate “the causes of the financial crisis that has gripped the economy”, and to report their findings to the Congress and the President. (Their final report is due December 15, 2010). The FCIC is established by law and endowed with subpoena power which it has already used in soliciting information from an unresponsive rating agency. Other government bodies and private organizations alike have formed committees and written “white papers” investigating particular aspects of the crisis. Indeed, the topic is so broad and so multivariate that numerous articles and research papers have already been written on any number of the detailed variables or products described summarily in this document. Some important factors which are the subject of public critique are not explored in this analysis, such as credit default swaps and over-the-counter derivatives; these are nonetheless important elements of an interconnected financial industry.

The extent to which the FCIC, other bodies, and the general public will hold particular firms or individuals legally or morally accountable for what is ultimately determined to be erroneous or improper actions remains to be seen. On April 17, 2010 the U.S. Securities

and Exchange Commission sued investment banking giant Goldman Sachs over what it claims to be improper structuring in the sale of a particular MBS product. The outcome of that suit is unknown at this time. Also unclear is the extent to which the government will continue its level of participation in and regulation of the housing and financial sectors. As of the writing of this document, a financial reform bill, sponsored by Christopher Dodd (D-CT) is making its way through the U.S. Senate. A summary provided on the Senate's website notes that the bill will create a new "independent watchdog" agency within the Federal Reserve, "end too big to fail", eliminate risky accounting loopholes, and provide shareholders with a say on executive compensation, among other objectives. A comparable financial reform bill has already passed in the House.

Whether a bill is passed, whether the Goldman suit or others like it are upheld, there is little doubt that many believe financial the industry is in need of at least greater oversight if not complete restructuring. Based on the analysis presented above, a few recommendations for reform seem obvious. Both the rating agencies and government sponsored enterprises suffer from poor business models. In the case of the former, the "issuer pays" model provides far too substantial a conflict of interest. The House reform bill mentioned above states: "The issuer-pay model has long created inherent conflicts of interest for which the [CRAs] have been criticized." Some sector analysts have suggested that one possible alternative is for issuers to the apply for a rating agency, which the SEC would then randomly assign. Such a system is likely to have shortcomings of its own, but the overall objective to avoid the existent market power and collusion which dominates the I-Bank / CRA relationship is well founded. The rating agencies and the SEC would also be wise to establish a new ratings scale for non-traditional structured finance products which provides the definitions, gradations, and distinction which the complicated products require. An AA-rated municipal bond and an AA-rated MBS tranche hardly carry the same level of risk; they should consequently have different monikers.

The idea of reform as relates to the five factors identified in this analysis is probably most controversial regarding the GSEs. The benefit of the GSEs in providing liquidity to the mortgage markets is widely noted, as is their relative success and stability prior to “the whole subprime mess”. Nonetheless, the GSEs by their very nature (prior to conservatorship) suffer from a basic business model problem: publically-mandated goals to be met through private business practices. Simply put, the GSEs cannot be forced to maintain market share and produce (i.e. provide affordable homeownership opportunities) at a certain level while competing against private market players. The public “mission” constrains their microeconomic alternatives. The logical conclusion, then, appears to be either to abandon the public mission (privatize the GSEs) or abandon the private business practice (nationalize the GSEs). Any middle ground will continue to hamper the GSEs in times of market expanse and give them unfair advantage in times of market decline.

Reform in the MBS and the larger structured finance sector is likely the first which will occur. Perhaps this is because Wall Street, with its multi-billion dollar profits and multi-million dollar executive pay, makes for an easy target. There has been much attention given the concept of “skin in the game”, or a requirement on MBS issuers to maintain a position within the issued securitization. While this has some traction, it is worthwhile to note that many issuers *did* have “skin in the game” during financial crisis, and it is precisely for that reason, among others, that Wall Street choked on the toxic MBS and CDO products. Other suggested reforms include caps on the amount of subprime mortgages which can be included in a particular securitization. But this strategy has two main faults: firstly, as noted in the earliest segments of this analysis, “subprime” is not always easy to define. Secondly, such regulations approach what many economists would agree is “market meddling”, a dangerous precedent for a free market economy. Instead, the most effective means of regulating investment banks and other structured finance players is likely to come in the way Wall Street always notices: profits. Namely, in the few MBS issues which have come to market since the collapse, investors are beginning to demand that issuers defer a portion of their fee until a given level of payout is achieved on the investment. Such manipulation of revenues, especially if conducted

industry-wide, is likely to incentivize issuers to maximize their own profits by aggregating products with a higher likelihood of continued payment.

Though subprime lending has been perhaps the most identified of the factors in the crisis, reform of the component has been comparatively less considered. Many market observers agree that repurchase agreements, by which the mortgage bankers are required to buy back mortgages from those packaging and selling them if they do not perform, should have longer terms. Others have suggested caps on how much of a given mortgage bankers' portfolio can be securitized—in essence requiring the lender to keep a portion of loans made on his balance sheet. However this is likely simply to encourage the lender to keep those loans which he feels are likely to perform best, and sell the remainder. Others have discussed the return to a system of interest rate caps and strict loan term requirements, but again such concepts become dangerous violations of the “free market economy” which many Americans hold dear. Lastly, many fear that a return to strict “for prime” lending will in essence translate to “red lining”, the discriminatory practice in which lenders refuse to lend borrowers money or credit based on race, income, or other such factors.

The only of the five factors considered in Part 2 (correlation) and not yet mentioned in this Part 4 is macroeconomic forces, which was ironically identified as the main causal factor in Part 3. There has been limited discussion in media reports addressing potential reforms to some of the macroeconomic forces which contributed to the crisis. Though public finance strategies such as the Federal Reserve's management of interest rates and money supply and the government's deficits and debts are widely reviewed and discussed, there has been little connection between these policies and the avoidance of future asset bubbles. Nor has there been much suggestion that the microeconomic decision of homebuilders need to be better policed. Perhaps the only “macroeconomic” factor which has received any considerable debate is homeownership, and homeownership rates. Namely, some critics have called into question whether homeownership is truly the American Dream it has increasingly been portrayed to be, and whether the government should direct its efforts and financial assets to the betterment of

rental opportunities in lieu of, and not just in addition to, the creation of affordable homeownership opportunities.

The above-listed reform suggestions are relatively substantial in scale, and would require the participation of many market players. Many of the current reform suggestions meeting acceptance are relatively smaller in scale, but nonetheless practical and important. Better disclosure will help all the players in the lending, securitization, and investment process to understand the underlying products and the due diligence conducted by their adjacent market players. More accurate risk pricing methodologies will enable unsophisticated and / or risk-averse investors to avoid sophisticated financial products. Safeguards and penalties for abuse and fraud will discourage predatory lending and borrower practices. Additional regulatory oversight will increase the “eyes on the street”, to ensure those entities interacting with the public are doing so honestly and consistently.

The intention of this analysis was, firstly, to determine the extent to which movements in five frequently blamed crisis factors were “historically anomalous”, that is, unusual compared against their own historical trends. That part concluded that while the most recent housing “bubble” was in fact historically anomalous, the histories of subprime lending and securitization are too limited to make an effective comparison. The actions of the GSEs and the rating agencies, however, did represent diversion from their historical precedents. The second part of this analysis placed the five factors in sequential order so as to describe causality and thereby organize the crisis into causes and effects. The final part provided a summary and a brief description and critique of current reform suggestions.

One thing remains certain: the financial markets in the U.S and many nations across the globe have suffered unprecedented volatility and loss in the last several years. A few “saw it coming”, but many, including the chiefs of government and private industry alike, did not. To the extent this analysis aides current or future public and private leaders in determining how such wreckage can be avoided, it will have been useful.

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